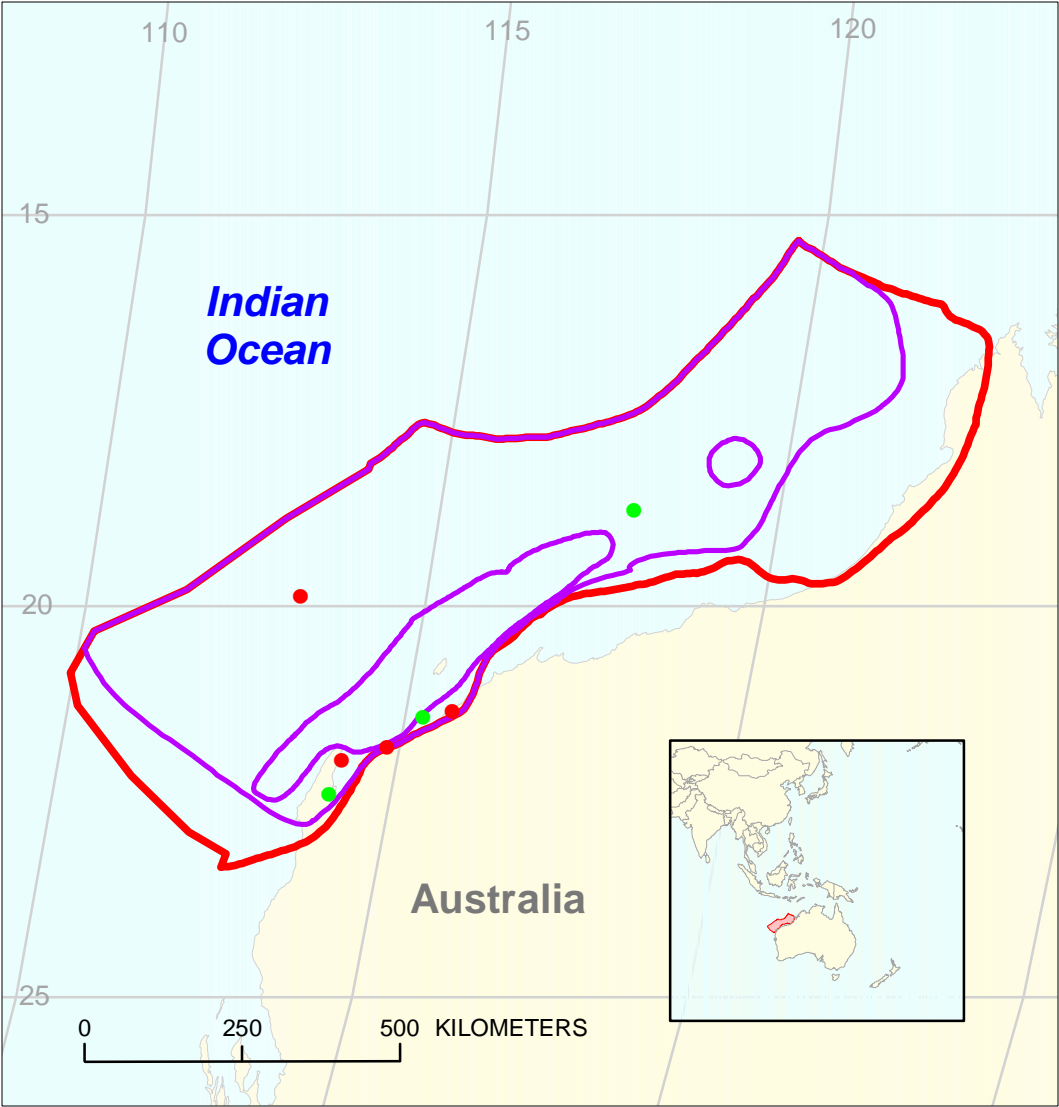




Locker-Mungaroo/Barrow Assessment Unit 39480201



-  Locker-Mungaroo/Barrow Assessment Unit 39480201
-  Northwest Shelf Geologic Province 3948

USGS PROVINCE: Northwest Shelf (3948)

GEOLOGIST: M.G. Bishop

TOTAL PETROELUM SYSTEM: Locker-Mungaroo/Barrow (394802)

ASSESSMENT UNIT: Locker-Mungaroo/Barrow (39480201)

DESCRIPTION: Triassic faulted basin with restricted-marine source rocks and deltaic to deep-water reservoir rocks underlying the Australian continental shelf.

SOURCE ROCK: The Lower Triassic Locker Shale source rock was deposited in terrestrially influenced, marine conditions at the beginning of continental breakup; TOC 1 to 3 wt. %, HI 200 to 300.

MATURATION: The source rock is mature across most of the entire province and over-mature where buried at great depth under the Jurassic-Cretaceous Barrow and Dampier sub-basin trend near the present-day coast.

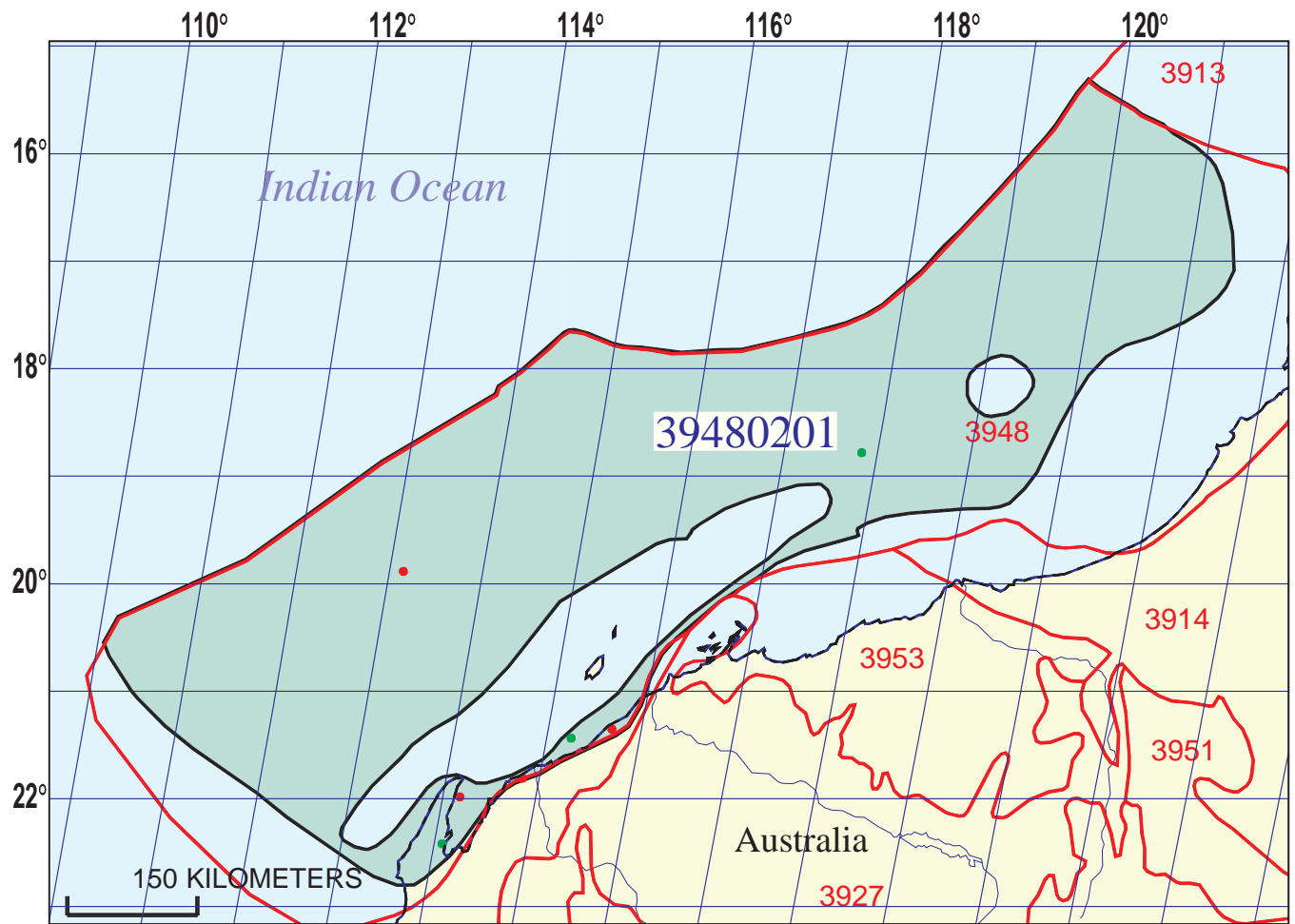
MIGRATION: Vertical migration along faults into overlying traps.

RESERVOIR ROCKS: The Late Triassic Mungaroo Formation and the Cretaceous Barrow Group are reservoir rocks of deep-water, proximal and distal deltaic, marginal marine, and alluvial origins.

TRAPS AND SEALS: Accumulations are found in tilted fault blocks and sediments overlying tilted fault blocks, structures along the southern and eastern flanks of the Jurassic-Cretaceous sub-basin trend, and on the inner structural terraces adjacent to the stable continent. The regional Muderong Shale seals many traps.








REFERENCES:

- Barber, P.M., 1988, The Exmouth Plateau deep water frontier—a case history, *in* Purcell, P.G., and Purcell, R.R., eds., *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society Australia Symposium*, Perth, 1988, p. 173-188.
- Bishop M.G., 1999, Total petroleum systems of the Northwest Shelf, Australia--the Dingo-Mungaroo/Barrow and the Locker-Mungaroo/Barrow: U.S. Geological Survey Open-File Report 99-50-E; <http://energy.cr.usgs.gov/energy/WorldEnergy/OF99-50E/index.html>.
- Scott, J., 1994, Source rocks of west Australian basins—distribution, character and models, *in* Purcell, P.G., and Purcell, R.R., eds., *The sedimentary basins of Western Australia: Proceedings of Petroleum Exploration Society of Australia Symposium*, Perth, 1994, p. 141-158.
- Stagg, M.J., and Colwell, J.B., 1994 The structural foundations of the northern Carnarvon Basin, *in* Purcell, P.G., and Purcell, R.R., eds., *The sedimentary basins of Western Australia: Proceedings of Petroleum Exploration Society of Australia Symposium*, Perth, 1994, p. 349-364.



Locker-Mungaroo/Barrow Assessment Unit - 39480201

EXPLANATION

-  Hydrography
-  Shoreline
- 3948  Geologic province code and boundary
-  Country boundary
-  Gas field centerpoint
-  Oil field centerpoint
- 39480201  Assessment unit code and boundary

Projection: Robinson. Central meridian: 0

**SEVENTH APPROXIMATION
NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT
DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS**

| | | |
|------------------------------|---|-------------------------|
| Date:..... | <u>11/24/98</u> | |
| Assessment Geologist:..... | <u>T.S. Ahlbrandt</u> | |
| Region:..... | <u>Asia Pacific</u> | Number: <u>3</u> |
| Province:..... | <u>Northwest Shelf</u> | Number: <u>3948</u> |
| Priority or Boutique:..... | <u>Priority</u> | |
| Total Petroleum System:..... | <u>Locker-Mungaroo/Barrow</u> | Number: <u>394802</u> |
| Assessment Unit:..... | <u>Locker-Mungaroo/Barrow</u> | Number: <u>39480201</u> |
| * Notes from Assessor | <u>Two gas fields, 11496 and 131 bcf.</u> | |

CHARACTERISTICS OF ASSESSMENT UNIT

Oil (<20,000 cfg/bo overall) **or** Gas (≥20,000 cfg/bo overall):... Gas

What is the minimum field size?..... 15 mmboe grown (≥1mmboe)
(the smallest field that has potential to be added to reserves in the next 30 years)

Number of discovered fields exceeding minimum size:..... Oil: 0 Gas: 2
Established (>13 fields) _____ Frontier (1-13 fields) X Hypothetical (no fields) _____

Median size (grown) of discovered oil fields (mmboe):
1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____
Median size (grown) of discovered gas fields (bcfg):
1st 3rd _____ 2nd 3rd _____ 3rd 3rd _____

Assessment-Unit Probabilities:

| <u>Attribute</u> | <u>Probability of occurrence (0-1.0)</u> |
|--|--|
| 1. CHARGE: Adequate petroleum charge for an undiscovered field ≥ minimum size..... | <u>1.0</u> |
| 2. ROCKS: Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size..... | <u>1.0</u> |
| 3. TIMING OF GEOLOGIC EVENTS: Favorable timing for an undiscovered field ≥ minimum size | <u>1.0</u> |

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):..... 1.0

4. **ACCESSIBILITY:** Adequate location to allow exploration for an undiscovered field
≥ minimum size..... 1.0

UNDISCOVERED FIELDS

Number of Undiscovered Fields: How many undiscovered fields exist that are ≥ minimum size?:
(uncertainty of fixed but unknown values)

| | | | | | |
|-------------------------------|----------|------------|-----------|---------|-----------|
| Oil fields:.....min. no. (>0) | <u>1</u> | median no. | <u>4</u> | max no. | <u>10</u> |
| Gas fields:.....min. no. (>0) | <u>4</u> | median no. | <u>21</u> | max no. | <u>60</u> |

Size of Undiscovered Fields: What are the anticipated sizes (**grown**) of the above fields?:
(variations in the sizes of undiscovered fields)

| | | | | | | |
|--------------------------------|-----------|-----------|-------------|------------|-----------|--------------|
| Oil in oil fields (mmbo)..... | min. size | <u>15</u> | median size | <u>25</u> | max. size | <u>200</u> |
| Gas in gas fields (bcfg):..... | min. size | <u>90</u> | median size | <u>150</u> | max. size | <u>15000</u> |

AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

| <u>Oil Fields:</u> | minimum | median | maximum |
|-----------------------------------|---------|--------|---------|
| Gas/oil ratio (cfg/bo)..... | 250 | 400 | 750 |
| NGL/gas ratio (bnl/mmcf)..... | 30 | 60 | 90 |
| <u>Gas fields:</u> | minimum | median | maximum |
| Liquids/gas ratio (bnl/mmcf)..... | 22 | 44 | 66 |
| Oil/gas ratio (bo/mmcf)..... | | | |

SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS

(variations in the properties of undiscovered fields)

| <u>Oil Fields:</u> | minimum | median | maximum |
|---|---------|--------|---------|
| API gravity (degrees)..... | 39 | 40 | 42 |
| Sulfur content of oil (%)..... | 0 | 0.02 | 0.03 |
| Drilling Depth (m) | 500 | 1000 | 2500 |
| Depth (m) of water (if applicable)..... | 0 | 1000 | 2000 |
| <u>Gas Fields:</u> | minimum | median | maximum |
| Inert gas content (%)..... | | | |
| CO ₂ content (%)..... | | | |
| Hydrogen-sulfide content (%)..... | | | |
| Drilling Depth (m)..... | 150 | 1200 | 2000 |
| Depth (m) of water (if applicable)..... | 0 | 1000 | 2000 |

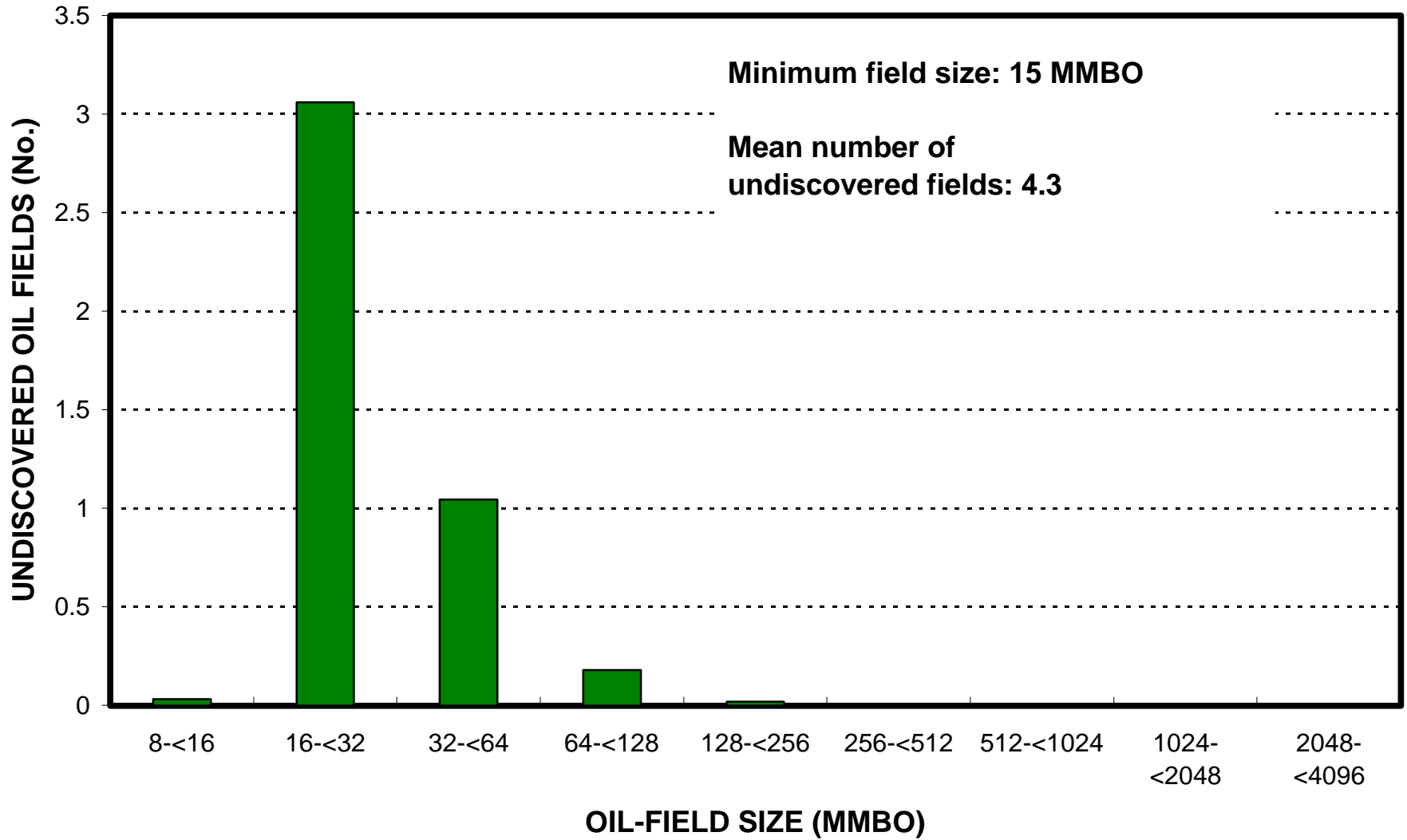
**ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT
 TO COUNTRIES OR OTHER LAND PARCELS** (uncertainty of fixed but unknown values)

1. Australia represents 100 areal % of the total assessment unit

| <u>Oil in Oil Fields:</u> | minimum | median | maximum |
|--|-------------|------------|-------------|
| Richness factor (unitless multiplier):..... | _____ | _____ | _____ |
| Volume % in parcel (areal % x richness factor):... | _____ | 100 | _____ |
| Portion of volume % that is offshore (0-100%)..... | _____ | 99 | _____ |
| <u>Gas in Gas Fields:</u> | minimum | median | maximum |
| Richness factor (unitless multiplier):..... | _____ | _____ | _____ |
| Volume % in parcel (areal % x richness factor):... | _____ | 100 | _____ |
| Portion of volume % that is offshore (0-100%)..... | _____ | 99 | _____ |

Locker-Mungaroo/Barrow, AU 39480201

Undiscovered Field-Size Distribution



Locker-Mungaroo/Barrow, AU 39480201

Undiscovered Field-Size Distribution

